NOAA Technical Memorandum NMFS

LIBRARY

OCT 19 1987

National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii

AUGUST 1987

ECONOMIC STATUS OF THE WASHINGTON, OREGON, AND CALIFORNIA GROUNDFISH FISHERY IN 1986

By

Charles S. Korson

Wesley Silverthorne

NOAA
TM
NMFS
SWR
no.18

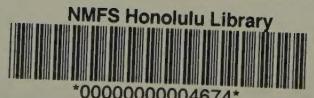
NOAA-TM-NMFS-SWR-018

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region

NOAA Technical Memorandum NMFS

The National Oceanic and Atmospheric Administration (NOAA), organized in 1970, has evolved into an agency which establishes national policies and manages and conserves our oceanic, coastal, and atmospheric resources. An organizational element within NOAA, the Office of Fisheries is responsible for fisheries policy and the direction of the National Marine Fisheries Service (NMFS).

In addition to its formal publications, the NMFS uses the NOAA Technical Memorandum series to issue informal scientific and technical publications when complete formal review and editorial processing are not appropriate or feasible. Documents within this series, however, reflect sound professional work and may be referenced in the formal scientific and technical literature.

NMFS Honolulu Library

00000000004674

NOAA Technical Memorandum NMFS

This TM series is used for documentation and timely communication of preliminary results, imterim reports, or special purpose information; and have not received complete formal review, editorial control, or detailed editing.

AUGUST 1987

ECONOMIC STATUS OF THE WASHINGTON, OREGON, AND CALIFORNIA GROUNDFISH FISHERY IN 1986

Charles S. Korson

Wesley Silverthorne

Southwest Region
National Marine Fisheries Service, NOAA
Terminal Island, California 90731

NOAA-TM-NMFS-SWR-018

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
National Oceanic and Atmospheric Administration
Anthony J. Calio, Administrator
National Marine Fisheries Service
William E. Evans, Assistant Administrator for Fisheries

Economic Status of the Washington, Oregon and California Groundfish Fishery in 1986

I. Introduction

This is the third in a series of annual reports describing the economic status of the Washington, Oregon, and California (West Coast) groundfish fishery. This fishery consists of business firms and recreationists which harvest fish stocks regulated under the Pacific Coast Groundfish Fishery Management Plan. Commercial firms exploiting groundfish include U.S. commercial fishing vessels employing a wide variety of gear, foreign trawl and processing vessels, party/charter vessels for recreational fishing, shoreside fish processing firms, and foreign processing vessels engaged in joint ventures with domestic commercial fishing vessels.

The focus of this report is on factors affecting the economic performance of domestic commercial firms in the West Coast groundfish fishery. Many (if not most) commercial and recreational groundfish vessels and groundfish processors catch or process non-groundfish species (e.g., crab, salmon, shrimp, and albacore) or conduct part of their business in Alaska. Consequently, developments in these fisheries which impact the West Coast groundfish fishery are described. The report reviews the performance of the fishery in 1986 and compares it to that in 1985. Section II presents an overview of the past fishing season, including a discussion of management actions affecting the progress of the fishery. The economic conditions of the commercial and recreational harvesting sectors are described in Section III and Section IV, respectively. Section V examines the performance of West Coast processing plants that produce groundfish products. Trends and changes in domestic and international markets for West Coast groundfish are presented in Section VI.

II. Overview of the Fishery in 1986

Domestic commercial landings of groundfish from U.S. waters off the West Coast increased significantly in 1986. Domestic shoreside and joint venture commercial landings totaled 164,000 metric tons (mt) in 1986. This was 33 percent above 1985 landings of 123,000 mt (Table 1). The exvessel value of the 1986 landings was approximately $66.7 million, about 7 percent higher than in 1985. After adjusting for inflation, the real exvessel value of commercial landings increased 4.5 percent. Total landings returned to the levels existing during 1983-1984 (Figure 1).

The increase in commercial groundfish production occurred because of a sharp recovery in joint venture landings, as shoreside landings fell by 10 percent to 82,200 mt (Table 1). In contrast, the joint venture pacific whiting catch more than tripled in 1986 to over 81,000 mt and almost exceeded shoreside volume for the first time in history. Over the last five years joint venture landings have continued to grow except in 1985; after reaching record highs in 1982, shoreside landings have declined generally except for a slight upturn in 1985 (Figures 2 and 3).

The exvessel value of shoreside landings was worth $57.9 million, about the same as in 1985 (Table 1). After discounting for inflation, the value of shoreside landings fell slightly. The decrease in the supply of shoreside groundfish over the years has continued to be offset by higher exvessel prices paid for commercially important groundfish species. Coastwide exvessel prices for sablefish, rockfish, and flatfish increased again in 1986 (Table 2). Exvessel prices in the joint venture fishery decreased by 10 percent from $0.054 per pound in 1985 to $0.048 per pound in 1986. Due to the increase in landings, the exvessel value of the joint venture fishery was $8.8 million in 1986, an increase of 132 percent from 1985.

The geographic distribution of groundfish landings by state and species is given in Table 3. In 1986, landings declined most noticeably in Washington (16.4 percent), followed by Oregon (14.2 percent) and California (4.2 percent). Within Washington, landings of sablefish and Dover sole were substantially lower. In Oregon, lower quantities of other rockfish and Dover sole accounted for the bulk of the decrease. In California, rockfish and Dover sole landings were off by 3.7 percent and 8.8 percent respectively (Table 3). The improvement in coastal exvessel prices failed to compensate for the reduced quantity of groundfish landed in Washington and Oregon; the exvessel value of landings in these states fell 14.6 percent and 1.7 percent, respectively. In California, the effect of higher exvessel prices offset the small decrease in production, as the exvessel value of landings was 7.6 percent above 1985 (Table 4).

The fisheries for principal species/species groups of the West Coast commercial groundfish catch are reviewed below and are summarized in Table 5.

Sablefish

Sablefish was the single most valuable groundfish species landed on the West Coast in 1986, as it was in 1985. West Coast sablefish landings were 13,154 mt in 1986. This was 3 percent under the optimum yield (OY) of 13,600 mt and 7 percent below the total landed in 1985. The exvessel value of the landed catch was

$12.36 million, only slightly below the 1985 exvessel value. The average real exvessel price reached a 7-year high (Table 2).

Groundfish trawls (bottom, roller, and midwater) accounted for 45.7 percent of sablefish landings, compared to over 50.3 percent in 1985 (Table 6). The contribution of sablefish to longline and miscellaneous fixed gear increased, but dropped from 25.5 to 23.6 percent for pot gear. The decline in the importance of the 1986 pot fishery and shift to longline gear is more pronounced when comparing the change in each gear group's share of the total value of sablefish landings (Table 6).

Projections of the sablefish catch in July, 1986 indicated that the OY would be reached early in the season. In order to avoid sablefish discards in the sablefish/thornyhead/Dover sole trawl fishery which would result if the OY were reached in early fall, the trawlers were placed on 8,000 pound sablefish trip limits, effective August 22. The projected remaining OY on August 22 was then allocated 55 percent to trawl landings and 45 percent to non-trawl landings. The non-trawl allocation was exhausted and the fishery closed on October 23. On the same date, the trawl trip limit was raised to 12,000 pounds because landings were not expected to reach the trawl quota.

Widow Rockfish

Widow rockfish landings were 9,555 mt in 1986, slightly lower than in 1985. Landings were 6 percent below the OY of 10,200 mt. An increase in the average coastwide exvessel price resulted in a 16 percent increase in the exvessel value of these landings to $5.8 million.

Since 1982, widow rockfish landings have been restricted by trip limits which are triggered when a certain percentage of the OY is landed. The purpose of the limit is to prevent early closure of the fishery and reduce discard mortality that would occur when the OY is reached early in the year. At the start of the 1986 fishing year, each vessel was limited to 30,000 pounds of widow rockfish per trip and one trip per week. In September 1986 the trip limit was reduced to 3,000 pounds when the allowable biological catch (ABC) of 9,300 mt was projected to be reached. This reduced limit eliminated the directed fishery for widow rockfish, and thus landings fell below the annual OY.

Pacific Ocean Perch (POP)

Landings of Pacific ocean perch were 1,346 mt, down 4 percent from the 1985 total of 1,406 mt. The exvessel value of the 1986 catch was $827,500. This fishery is regulated by trip limits and quotas to rebuild depressed stocks in the Vancouver and Columbia International Pacific Fisheries Commission Statistical areas.

The increase in commercial groundfish production occurred because of a sharp recovery in joint venture landings, as shoreside landings fell by 10 percent to 82,200 mt (Table 1). In contrast, the joint venture pacific whiting catch more than tripled in 1986 to over 81,000 mt and almost exceeded shoreside volume for the first time in history. Over the last five years joint venture landings have continued to grow except in 1985; after reaching record highs in 1982, shoreside landings have declined generally except for a slight upturn in 1985 (Figures 2 and 3).

The exvessel value of shoreside landings was worth $57.9 million, about the same as in 1985 (Table 1). After discounting for inflation, the value of shoreside landings fell slightly. The decrease in the supply of shoreside groundfish over the years has continued to be offset by higher exvessel prices paid for commercially important groundfish species. Coastwide exvessel prices for sablefish, rockfish, and flatfish increased again in 1986 (Table 2). Exvessel prices in the joint venture fishery decreased by 10 percent from $0.054 per pound in 1985 to $0.048 per pound in 1986. Due to the increase in landings, the exvessel value of the joint venture fishery was $8.8 million in 1986, an increase of 132 percent from 1985.

The geographic distribution of groundfish landings by state and species is given in Table 3. In 1986, landings declined most noticeably in Washington (16.4 percent), followed by Oregon (14.2 percent) and California (4.2 percent). Within Washington, landings of sablefish and Dover sole were substantially lower. In Oregon, lower quantities of other rockfish and Dover sole accounted for the bulk of the decrease. In California, rockfish and Dover sole landings were off by 3.7 percent and 8.8 percent respectively (Table 3). The improvement in coastal exvessel prices failed to compensate for the reduced quantity of groundfish landed in Washington and Oregon; the exvessel value of landings in these states fell 14.6 percent and 1.7 percent, respectively. In California, the effect of higher exvessel prices offset the small decrease in production, as the exvessel value of landings was 7.6 percent above 1985 (Table 4).

The fisheries for principal species/species groups of the West Coast commercial groundfish catch are reviewed below and are summarized in Table 5.

Sablefish

Sablefish was the single most valuable groundfish species landed on the West Coast in 1986, as it was in 1985. West Coast sablefish landings were 13,154 mt in 1986. This was 3 percent under the optimum yield (OY) of 13,600 mt and 7 percent below the total landed in 1985. The exvessel value of the landed catch was

$12.36 million, only slightly below the 1985 exvessel value. The average real exvessel price reached a 7-year high (Table 2).

Groundfish trawls (bottom, roller, and midwater) accounted for 45.7 percent of sablefish landings, compared to over 50.3 percent in 1985 (Table 6). The contribution of sablefish to longline and miscellaneous fixed gear increased, but dropped from 25.5 to 23.6 percent for pot gear. The decline in the importance of the 1986 pot fishery and shift to longline gear is more pronounced when comparing the change in each gear group's share of the total value of sablefish landings (Table 6).

Projections of the sablefish catch in July, 1986 indicated that the OY would be reached early in the season. In order to avoid sablefish discards in the sablefish/thornyhead/Dover sole trawl fishery which would result if the OY were reached in early fall, the trawlers were placed on 8,000 pound sablefish trip limits, effective August 22. The projected remaining OY on August 22 was then allocated 55 percent to trawl landings and 45 percent to non-trawl landings. The non-trawl allocation was exhausted and the fishery closed on October 23. On the same date, the trawl trip limit was raised to 12,000 pounds because landings were not expected to reach the trawl quota.

Widow Rockfish

Widow rockfish landings were 9,555 mt in 1986, slightly lower than in 1985. Landings were 6 percent below the OY of 10,200 mt. An increase in the average coastwide exvessel price resulted in a 16 percent increase in the exvessel value of these landings to $5.8 million.

Since 1982, widow rockfish landings have been restricted by trip limits which are triggered when a certain percentage of the OY is landed. The purpose of the limit is to prevent early closure of the fishery and reduce discard mortality that would occur when the OY is reached early in the year. At the start of the 1986 fishing year, each vessel was limited to 30,000 pounds of widow rockfish per trip and one trip per week. In September 1986 the trip limit was reduced to 3,000 pounds when the allowable biological catch (ABC) of 9,300 mt was projected to be reached. This reduced limit eliminated the directed fishery for widow rockfish, and thus landings fell below the annual OY.

Pacific Ocean Perch (POP)

Landings of Pacific ocean perch were 1,346 mt, down 4 percent from the 1985 total of 1,406 mt. The exvessel value of the 1986 catch was $827,500. This fishery is regulated by trip limits and quotas to rebuild depressed stocks in the Vancouver and Columbia International Pacific Fisheries Commission Statistical areas.

Other Rockfish

Total West Coast landings of rockfish (other than widow rockfish and POP) were 26,300 mt compared to 27,400 mt in 1985. This is a 4 percent decrease from 1985 and represents the smallest decline in yearly landings since trip limit regulations were imposed on the Sebastes species complex in the Vancouver/Columbia INPFC areas. The small drop in landings combined with rising exvessel prices sent the exvessel value of rockfish landings to $18.8 million, or 7 percent higher than in 1985.

West Coast rockfish landings stabilized in 1986. Trip limit and trip frequency regulations implemented at the beginning of the year were effective in keeping the harvest of the Sebastes complex of rockfish (all rockfish except Pacific ocean perch, widow rockfish, shortbelly rockfish, and Sebastolobus rockfishes) under the harvest guideline (10,100 mt) established north of 43° 22' N. latitude (Coos Bay, Oregon). To protect yellowtail rockfish stocks in the northern management area, fishermen were given three harvesting options: (1) per vessel weekly trip limit of 25,000 pounds of the Sebastes complex, including no more than 10,000 pounds of yellowtail rockfish, (2) per vessel biweekly trip limit of 50,000 pounds of Sebastes, with no more than 20,000 pounds of yellowtail rockfish allowed, and (3) twice weekly trip limit up to 12,500 pounds of Sebastes, including no more than 5,000 pounds of yellowtail per vessel per trip north of Coos Bay, Oregon. A trip limit of 40,000 pounds with no restriction on the frequency of trips continued in effect for Sebastes rockfish caught south of Coos Bay, Oregon.

Flatfish

Landings of all flatfish species declined 15 percent to 26,000 mt. The most important single species, Dover sole, accounted for the largest decrease in production, totaling 17,300 mt in 1986, compared to 20,600 mt in 1985. English sole was the only flatfish species that had higher landings in 1986. Despite higher average exvessel prices paid for major flatfish species, with the exception of English sole, the exvessel value of landings for all species categories decreased (Table 3). Even though the exvessel value of Dover sole declined, this species still ranked as the second most valuable groundfish landed on the West Coast in 1986.

Dover sole landings reportedly declined because several trawl vessels switched to pink shrimp and joint venture fisheries, causing fishing effort on Dover sole to fall. The West Coast pink shrimp and joint venture fisheries had sharply higher landings in 1986. In a study of the Oregon fishing fleet, very few trawl vessels were observed to be fishing for groundfish when pink shrimp landings and prices were high in the summer of

1986 (E. Pikitch, Oregon State University, Newport, Oregon, pers. comm.).

Pacific whiting

Shoreside landings of Pacific whiting were about the same as in 1985. Midwater trawl vessels delivered 3,463 mt to shoreside processing facilities compared to 3,894 mt in 1985, the highest year for shoreside production to date. The industry sells primarily frozen, headed-and-gutted whiting in 5 and 10 pound boxes.

Joint venture landings of whiting more than tripled due to the increased activity by Poland and the Soviet Union, the only two foreign nations purchasing U.S. caught whiting at sea. The exvessel value of the joint venture fishery ($8.76 million) did not increase proportionally with landings due to lower average exvessel prices.

III. Commercial Harvesting Sector

Otter Trawl Fleet

The total quantity of groundfish landed with bottom, roller, and midwater trawls increased 34 percent to 143,100 mt in 1986. The exvessel value of shoreside and joint venture trawl deliveries was $44.9 million, or about the same as in 1985 ($45.1 million). However, this increase was not shared equally between the two delivery modes. The volume of shoreside trawl landings decreased to 61,250 mt compared to 75,350 mt in 1985 (Table 7). Similarly, the exvessel value of shoreside trawl deliveries was 13 percent lower than in 1985 (Table 8). In contrast, joint venture trawl production was sharply higher in 1986, more than compensating for the reduction in shoreside trawl landings. The trend in the quantity and value of trawl landings over the last five years is generally decreasing for shoreside, but is growing for joint ventures (Figures 3 and 4).

The groundfish trawl fleet consists of vessels which either deliver to shoreside processing facilities or participate in joint ventures. These groundfish trawl vessels exhibit a significant amount of geographic mobility. Midwater trawlers may fish in joint venture operations off the West Coast or Alaska in spring and summer, and then deliver rockfish to shoreside processors in the winter. Some nearshore trawlers are known to make seasonal shifts between distant ports. Very few trawlers depend on one groundfish species, but rather are multispecies fishing operations, harvesting an array of groundfish and non-groundfish species such as shrimp, crab, salmon, and albacore. Thus the economic performance of groundfish trawlers may be affected considerably by conditions outside of the West Coast groundfish fishery.

In 1986, the number of trawl vessels making one or more shoreside groundfish landings over 1,000 pounds with groundfish trawl gear was 308, down 50 vessels from 1985. This represents the fifth consecutive year in which there has been a net decline in the size of the West Coast shoreside trawl fleet (Table 9). The majority of the trawlers leaving the fleet were again in the 40-69 foot size class, reflecting the resurgence in the pink shrimp fishery that diverted trawl effort away from groundfish (Table 10). There were 25 vessels that fished in Pacific whiting joint ventures two of which did not deliver to shore. Therefore, the total groundfish trawl fleet was 310 vessels, down 13 percent from 359 in 1985.

The net loss of 49 groundfish trawl vessels is the result of 77 vessels departing and 28 vessels entering. As in 1985 industry and state agency personnel were surveyed to monitor the disposition of trawl vessels that exited the fleet in 1986. Out of a total of 77 trawl vessels which left the fleet, 26 (33.8 percent) converted to shrimp trawling (Table 11). The remaining 51 trawl vessels either went to Alaska (13 percent), switched to other gears (9.1 percent), were repossessed (2.6 percent), sank or were lost (19.5 percent), became inactive (9.1 percent), or had unknown fates (13.0 percent). Particularly noteworthy is the fewer number of trawlers that left the fleet due to financial difficulties than in 1985.

One measure of economic performance is average gross revenue from groundfish landings per trawl vessel. Shoreside groundfish trawlers earned an average of $116,600 per vessel in 1986, up slightly from the $115,200 in gross revenues per vessel in 1985 (Table 12). This is the highest gross revenue output recorded by shoreside trawlers in the last six years. In the joint venture fishery, gross revenue per trawl vessel improved significantly, averaging $350,400 per vessel or 59 percent higher than in 1985 (Table 13). Combining these two sources of landings, average gross revenue was $144,800 per vessel in 1986 compared to $125,700 per vessel in 1985. Thus, a reduced fleet size, higher real exvessel prices, and an improved joint venture catch combined to increase gross revenues from groundfish landings for trawlers in 1986.

Several West Coast trawlers participate in alternative fisheries to complement groundfish earnings. The Washington, Oregon, and California pink shrimp fishery provided groundfish trawlers with a lucrative source of revenues, since coastwide landings recovered dramatically in 1986. The 1986 coastal pink shrimp landings were 58 million pounds, the third highest total ever recorded, and the exvessel value of $30.9 million was the highest in history. The importance of the pink shrimp fishery to West Coast trawl vessels is reflected by the share of gross revenues each species group contributes to the total fleet's

combined production of groundfish and shrimp. In 1986, the revenue share attributable to pink shrimp increased significantly (Figure 5).

Another source of revenue for some West Coast groundfish trawlers is Alaskan shoreside and joint venture groundfish fisheries. In 1986, Alaskan shoreside groundfish landings increased 26 percent to 144,200 mt, while joint venture groundfish landings rose 38 percent to 1,222,000 mt.

Pot/Trap Vessels

West Coast groundfish landings by pot/trap vessels fell significantly in 1986 (Table 7). The 1986 catch was 2,200 mt, 40 percent below 1985 landings and the lowest total landed by the pot/trap fleet since 1981. Similarly, the exvessel value of the 1986 landings ($2.2 million) was down 38 percent, even though the average exvessel price remained at about $.45 per pound (Table 8). The drop in landings was especially pronounced in Washington, where only 37 mt were landed in 1986.

A total of only 25 pot/trap vessels landed sablefish on the West Coast in 1985, the lowest number of vessels participating in the last five years (Table 9). Average landings decreased 24 percent to 88 mt per vessel. Gross revenue per vessel was approximately $100,000, 8.5 percent lower than in 1985 (Table 12).

Longline Vessels

The West Coast longline fleet landed 3,541 mt of groundfish in 1986, up 12 percent from 1985 landings. This is the largest longline catch landed since 1981 (Table 7). Similarly, the exvessel value of longline landings was $5.58 million, surpassing the previous recorded high of $4.93 million set in 1985 (Table 8). The average exvessel price of $0.69 per pound was substantially higher than for pot gear ($0.45 per pound). From 1985-1986 longline landings have increased, following low production occurring from 1983-1984 (Figure 6).

Other Gear Vessels

The quantity of groundfish landed by other gears, including set net, troll, jig, commercial pole and shrimp trawl, totaled approximately 15,250 mt in 1986. This was 63 percent higher than the 9,375 mt landed in 1985.

The large increase in landings is due to a jump in the other/miscellaneous gear category (Table 7). Within California this is particularly notable, since there was a significant quantity of landings that fell into the unknown gear category as reported in the coastwide PacFIN management database.

Landings of set net gear increased 4 percent in 1986. The exvessel value of these landings showed a similar increase (Table 8). The expansion in the West Coast set net fishery slowed somewhat in 1986, but still grew at a faster rate than other fixed gear groups from 1981-1986 (Figure 6).

IV. Recreational Harvesting Sector

Groundfish are caught for recreation by anglers who fish from piers, jetties, beaches, banks, party or charter passenger vessels and private or rental boats. The 1986 West Coast recreational groundfish catch was approximately 13.1 million fish, down 8 percent from the total for 1985 (Table 14). The decline in recreational groundfish landings was felt in each state. The contribution of West Coast groundfish to the total coastal recreational catch fell to only 24 percent, the lowest in six years. However, this percentage decrease is partly due to the reported high Pacific mackerel recreational landings in 1986 (MRFSS 1987).

The distribution of recreational groundfish catches among the different modes of fishing indicates that party/charter and private boats dominate the recreational groundfish catch (Table 15). In 1986 the party/charter and private boat recreational groundfish catch accounted for 93 percent of groundfish landed by anglers. As in 1985, statistics on angler participation rates attributable to groundfish fishing as well as the number of directed groundfish trips taken by commercial passenger fishing vessels are not available. In California, it has been estimated that 365 vessels made at least one directed groundfish sportfishing trip in 1986 (S. Crooke, CDFG, Long Beach, pers. comm.).

V. Groundfish Processing Sector

Every year the NMFS surveys processing plants on the West Coast (including Puget Sound) to determine the volume and value of processed fish products and employment in the fish processing sector. Response rates vary from year to year and from state to state. As in recent years the response in Washington and Oregon was close to 100 percent for the 1986 survey. However, at the time of this writing the response in California has been estimated at only 20-25 percent. Therefore, the statistics presented in this section will not include the 1986 activity of California's groundfish processing sector.

The results of the Processed Product Survey were used to compute average wholesale prices received by West Coast processors for groundfish products. During recent years, as the supply of groundfish delivered to shore has decreased, groundfish wholesale prices have moved upward more rapidly than the general

rate of inflation (Table 16). This trend continued in 1986, with average inflation adjusted wholesale prices for most species categories substantially higher than in 1985. Most of the finished flatfish and rockfish products are sold as fresh, raw fillets to wholesalers, brokers, supermarkets, restaurants, and retail fresh fish outlets. A smaller quantity of flatfish and rockfish is sold as frozen fillets. Sablefish are filleted or smoked for the domestic market and dressed for the international market.

The number of processing plants producing groundfish in 1986 is given in Table 17 for Oregon and Washington; statistics for California are unavailable. According to the survey results, Washington had six fewer groundfish processing plants in 1986, while the number remained almost constant in Oregon. The departing Washington plants either shifted out of groundfish into crab, salmon, or other non-groundfish species, became strictly wholesalers, or stopped operating entirely.

Employment in West Coast groundfish processing plants is provided for the years 1985-86 (Table 18). Due to the decrease in the number of Washington groundfish plants, average employment declined in each month during 1986. The 1986 survey reports significantly higher employment in Oregon groundfish plants.

VI. West Coast Groundfish Markets

The total quantity of West Coast domestically caught fresh and fresh-frozen groundfish supplied to West Coast markets decreased in 1986. This decrease in supply was partially offset by large increases in imports of groundfish products from Canada and New Zealand. Imports of fresh and fresh-frozen rockfish fillets from Canada into West Coast ports more than doubled (Table 19). Increased imports of fresh, chilled or frozen orange roughy fillets from New Zealand added to the West Coast supply of groundfish. Orange roughy fillets imported from New Zealand were 4,750 mt in 1986, 24 percent higher than in 1985 (Table 19). Because of the large increase in imports, the total supply of groundfish to the West Coast was probably higher in 1986, despite the 10 percent decline in shoreside groundfish landings.

The increase in imports may be partly explained by the appreciation in the U.S. dollar relative to Canadian and New Zealand currencies. The average exchange rate with Canada was 1.390/U.S. dollar in 1986, about 2 percent stronger than in 1985 (Table 20). The U.S. dollar appreciated relative to the New Zealand dollar by 5 percent in 1985.

As reported in U.S. Bureau of Census statistics, West Coast exports of sablefish in 1986 increased 66.6% to 26.6 million pounds, compared to 1985. The reported value of these exports increased from $22.1 million in 1985 to $36.1 million in 1986.

The Japanese were the major buyer, purchasing 98.6% of total West Coast sablefish exports. The average export value of $1.36 per pound was down slightly from the 1985 value of $1.39 per pound. Prices in yen were well below a year earlier. Wholesale prices on the Tokyo market for 5-7 lb., 4-5 lb., and 3-4 lb. fish were 16, 20, and 28% lower, respectively than in 1985 when quoted in yen (Table 21), but increased when quoted in U.S. dollars. The average value of the yen compared to the U.S. dollar increased 29% in 1986 from 1985 (Table 20).

Acknowledgments

The authors wish to thank the fisheries agencies of Washington, Oregon and California and Pete Leipzig of the Fisherman's Marketing Association for assistance in preparing the inventory of trawl vessels landing groundfish and identifying the disposition of trawl vessels leaving the fleet in 1986. Dick Kinoshita, NMFS, Northwest and Alaska Fisheries Center, made a large contribution to this years' report by writing the section on Japanese export markets. We are also indebted to Janet Smoker of the NMFS, Alaska Region, for providing data on Alaska joint venture trawl vessel activity. Finally, thanks are due to Karen Shields for typing the manuscript.

Literature Cited

National Marine Fisheries Service. 1984. Marine Recreational Fishery Statistics Survey, Pacific Coast, 1981-1982, Current Fishery Statistics No. 8323, 203pp.

_____. 1985. Marine Recreational Fishery Statistics Survey, Pacific Coast, 1983-1984, Current Fishery Statistics No. 8325, 189pp.

_____. 1986. Marine Recreational Fishery Statistics Survey, Preliminary Unpublished data for 1985.

_____. 1987. Marine Recreational Fishery Statistics Survey, Preliminary Unpublished data for 1986.

Table 1 - Landings and Exvessel Values of Landings in Washington, Oregon, and California, Including Joint Venture Deliveries in Waters off These States.

	1985	1986	% Change
Shoreside (mt)	91,313	82,238	-9.9
Joint Venture (mt)	31,747	81,855	+357.8
Total WOC Landings	123,060	164,093	+33.3
Shoreside Values $			
Current	58,343,000	57,895,000	-0.77
Real[1]	59,899,000	57,895,000	-3.3
Joint-Venture Value			
Current	3,779,000	8,760,000	+131.8
Real[1]	3,880,000	8,760,000	+125.8
Total WOC Groundfish Landed Value			
Current	62,121,000	66,655,000	+7.3
Real	63,779,000	66,655,000	+4.5

1/ Real values are current values adjusted to eliminate the effects of inflation. This adjustment has been made by dividing current values by the current year GNP implicit price deflator, with a base year of 1986. The GNP deflators are 1.00 in 1986 and 0.974 in 1985.

Source: Pacific Coast Fishery Information Network (PacFIN), April 1987 Groundfish Report Series, Preliminary Data
NMFS, Northwest Region

Table 2- Average Annual Exvessel Prices Paid for Some Commercially Important Groundfish Species from 1977-1986.

	Sablefish		All Rockfish Combined		Widow Rockfish		Dover Sole		English Sole		Petrale Sole	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1977	.154	.261	.163	.277	-	-	.161	.273	.237	.402	.315	.535
1978	.283	.448	.181	.286	-	-	.207	.327	.245	.388	.371	.587
1979	.356	.518	.199	.290	-	-	.215	.313	.286	.416	.447	.651
1980	.199	.265	.159	.212	-	-	.211	.281	.328	.437	.458	.611
1981	.215	.262	.170	.207	.139	.169	.222	.270	.297	.362	.512	.624
1982	.260	.298	.196	.225	.158	.181	.233	.267	.318	.365	.606	.696
1983	.250	.276	.224	.247	.194	.214	.224	.247	.322	.356	.683	.755
1984	.233	.248	.251	.267	.226	.241	.231	.246	.322	.343	.709	.755
1985	.399	.410	.282	.289	.250	.257	.240	.246	.333	.342	.736	.756
1986	.426	.426	.314	.314	.277	.277	.258	.258	.360	.360	.777	.777

Source: PacFIN, Groundfish Report Series

NOTE: Real prices were adjusted for inflation using the GNP implicit price deflator, where 1986=1.00. All prices are weighted averages.

Table 3 - Commercial Landings (mt) of Individual Groundfish Species by State for 1985 and 1986.

Species	California		Oregon		Washington	
	1986	1985	1986	1985	1986	1985
Lingcod	514	695	653	1,052	714	2,135
Pacific Cod	-	1	33	39	303	388
Pacific Whiting	2,982	2,996	420	885	61	14
Sablefish	6,099	5,128	4,666	5,275	2,388	3,869
Pacific Ocean Perch	30	67	667	797	649	542
Widow Rockfish	2,468	3,068	4,322	4,353	2,765	1,666
Other Rockfish	14,414	14,966	6,754	7,947	4,731	4,228
Dover Sole	10,987	12,047	4,814	5,713	1,479	2,804
English Sole	1,074	1,062	553	468	403	399
Petrale Sole	711	857	711	577	313	405
Other Flatfish	1,701	1,848	1,283	1,869	1,982	2,418

Source: PacFIN, Groundfish Report Series

Table 4 - California, Oregon, and Washington Shoreside Commercial Groundfish Landings (Metric Tons) and Exvessel Values (Thousands of Dollars) from 1977-1986.

Year	California		Oregon		Washington		Total Coast	
	mt	$	mt	$	mt	$	mt	$
1977	32,082	12,185	10,172	4,150	12,712	4,362	54,966	20,697
1978	36,805	18,457	16,469	7,871	19,285	8,213	72,559	34,541
1979	36,392	19,566	28,935	17,264	22,508	11,112	87,835	47,942
1980	36,862	16,551	28,515	11,425	22,514	9,119	87,891	37,095
1981	42,698	21,460	37,487	14,711	23,683	10,653	103,868	46,824
1982	52,608	27,795	41,021	20,444	25,474	12,100	119,002	60,339
1983	39,498	21,984	35,200	18,420	22,970	11,796	97,668	52,200
1984	40,570	22,914	28,211	15,237	21,074	11,117	89,855	49,268
1985	43,061	26,516	29,023	17,095	19,229	14,731	91,313	58,342
1981-85 Average	43,687	24,134	34,188	17,184	22,486	12,079	100,341	53,455
1986	41,246	28,522	24,911	16,796	16,081	12,576	82,238	57,895

Source: State Fishery Agencies
PacFIN, Groundfish Report Series, April 1987

Table 5 - Landings and Value of Individual Groundfish Species Landed in Washington, Oregon, and California in 1985 and 1986. [1]

Species	1986		1985		% Change	
	mt.	$	mt.	$	mt.	$
Lingcod	1,881	1,394,000	3,882	2,396,800	-51.5	-41.8
Pacific Cod	336	203,500	427	230,800	-21.3	-11.8
Pacific Whiting	3,463	448,500	3,894	582,800	-11.1	-23.6
Sablefish	13,154	12,361,700	14,273	12,544,600	-7.8	-1.5
Pacific Ocean Perch	1,346	827,500	1,406	781,100	-4.3	+5.9
Widow Rockfish	9,555	5,833,600	9,087	5,015,100	+5.1	+16.3
Other Rockfish	26,258	18,821,700	27,369	17,606,600	-4.1	+6.9
Dover Sole	17,280	9,818,900	20,564	10,876,300	-16.0	-9.7
English Sole	2,030	1,610,400	1,929	1,417,400	+5.2	+13.6
Petrale Sole	1,735	2,970,500	1,839	2,983,300	-5.6	-0.43
Other Flatfish	4,969	3,011,600	6,136	3,428,300	-19.0	-12.1
TOTAL	82,005	57,299,100	90,805	56,863,100	-9.7	+0.77

Source: PacFIN, Groundfish Report Series

1/ Includes domestic landings from U.S. coastal waters off WOC, but not Puget Sound; A small amount of landings of miscellaneous groundfish species are not included in the totals.

Table 6. West Coast Landings and Exvessel Value of Sablefish by Gear, 1985 and 1986.[1]

	Total WOC 1985				1986			
	mt		$		mt		$	
Ground trawl	7,173.3	(50.3)	3,454.0	(27.5)	6,007.6	(45.7)	3,582.0	(29.0)
Pot	3,637.9	(25.5)	3,551.0	(28.3)	2,107.1	(23.6)	2,125.8	(17.2)
Longline	2,750.9	(19.3)	4,736.4	(37.8)	3,547.5	(27.0)	5,574.9	(45.1)
Net	330.7	(2.3)	540.2	(4.3)	117.1	(0.9)	55.3	(0.4)
Other	379.9	(2.7)	263.0	(2.1)	1,374.9	(10.4)	1,023.7	(8.3)
Total	14,272.7		12,544.6		13,154.0		12,361.7	

1/ Figures in parentheses are the percentages each gear group contributed to the total landed catch and exvessel value.

Table 7 - West Coast Groundfish Shoreside Landings (metric tons) by gear group, 1981-86.

	Trawl	Trap/ Pot	Setline/ Longline	Net	Other/Misc
1981	91,328	3,956	2,599	1,738	4,173
1982	103,297	6,530	2,504	2,028	4,542
1983	81,727	5,437	1,307	2,303	6,891
1984	72,694	3,854	1,351	2,212	9,744
1985	75,352	3,703	3,155	4,058	5,318
1986	61,252	2,208	3,541	4,232	11,014

Source: PacFIN, Groundfish Report Series

Table 8 - Exvessel Value (thousands of dollars) of West Coast Groundfish Landings by gear group, 1981-1986.

	Trawl	Trap/Pot	Set/Longline	Net	Other/Misc
1981	38,164	2,038	2,149	1,498	2,867
1982	47,227	4,882	2,749	1,769	3,712
1983	40,752	3,637	1,321	1,826	4,664
1984	36,994	2,362	1,602	1,962	6,349
1985	41,375	3,596	4,928	3,584	4,949
1986	36,133	2,212	5,380	3,743	10,434

Source: PacFIN, Groundfish Report Series

Table 9 - Number of Shoreside Vessels in Washington, Oregon, and California Commercial Groundfish Fleets, 1981-1986.

Year	Otter Trawl	Pot/Trap[1]	Longline[1]
1981	408	66	191
1982	444	82	208
1983	436	59	185
1984	397	34	96[2]
1985	358	32	129[2]
1986	308	25	190[2]

Source: State Fishery Agencies

1/ Vessels landing fish caught with this gear-type in two or more states are counted in each state for years 1982-83. These numbers therefore are an upper bound for the true number of vessels using this gear-type.

2/ Represents number of longline vessels landing in Oregon and Washington, where double counting has been eliminated; California data unavailable for those years.

Table 10 - Washington, Oregon, and California Groundfish Shoreside Trawl Fleet Characteristics, 1983-86.

	1983	1984	1985	1986
Total Number Landing	436	397	358	308
Frequency by Size (Length) Class				
< 30 feet	2	2	2	1
30-39	22	20	15	9
40-49	112	100	96	73
50-59	124	108	93	87
60-69	109	104	98	90
70-79	43	44	39	37
80-89	11	11	6	6
> 90	13	8	9	5
Vessel Characteristics:				
Average Length	57.25	57.41	57.6	58.2
Average Horsepower	312.4	312.4	309.7	310.8
Average Net Tonnage	45.7	45.5	45.8	47.6
Number Vessels Based in Each State				
California	195	169	157	126
Oregon	161	146	121	110
Washington	80	82	80	72
Vessels Landing in More than One State	74	61	41	34

Source: State Fishery Agencies

Table 11. Disposition of Trawl Vessels Leaving the Fleet in 1985 and 1986.

Status	Frequency 1985	Frequency 1986	Relative Percentage (%) 1985	Relative Percentage (%) 1986
Alaska	15	10	17.6	13.0
West Coast Shrimp Fishery	8	26	9.4	33.8
Other Gears (Longline, gillnet, etc.)	4	7	4.7	9.1
Bank Repossession	6	2	7.1	2.6
Lost at Sea (Sank, Burned)1	17	15	20.0	19.5
Idle	10	7	11.8	9.1
Unknown	25	10	29.4	13.0
TOTAL	85	77		

Source: West Coast Fisherman's Marketing Association
State Fishery Agencies

1/ Includes vessels that were damaged, but which may not be permanent losses.

Table 12 - West Coast Commercial Groundfish Shoreside Landings, Exvessel Values (Thousands of Dollars) and Average Vessel Gross Revenues for Selected Gear Groups, 1980-1986. (Numbers of vessels using gear types other than the three listed below are unknown).

Year	Otter Trawl[1]			Pot/Trap			Longline		
	mt	$	$ per Vessel	mt	$	$ per Vessel	mt	$	$ per Vessel
1981	91,300	38,200	93.6	3,955	2,038	30.9	2,600	2,150	11.3
1982	103,300	47,227	106.4	6,530	4,882	59.5	2,500	2,750	13.2
1983	81,700	40,752	93.5	5,440	3,635	59.6	1,300	1,322	7.2
1984	72,500	36,940	92.6	3,854	2,354	69.2	1,346	1,601	N/A
1985	75,352	41,365	115.2	3,703	3,596	108.9	3,155	4,928	N/A
1986	61,252	36,133	116.6	2,208	2,490	99.6	3,541	5,380	N/A

1/ Includes bottom, roller, and midwater trawls.

Source: PacFIN, Groundfish Report Series.

Table 13 - Landings and Participation in Pacific Whiting Joint-Venture Fisheries off of Washington, Oregon, and California, 1979-1986.

Year	Landings (mt)	Estimated Dollar Value ($)	Number of Trawl Vessel	Average Revenue Per Vessel ($)
1979	9,054	1,162,000	11	105,600
1980	26,793	3,275,000	15	218,300
1981	43,758	6,345,000	21	302,100
1982	68,420	10,367,000	17	609,800
1983	72,140	10,217,000	19	537,700
1984	79,047	11,841,000	21	563,800
1985	31,567	3,751,000	17	220,700
1986	81,855	8,760,000	25	350,400

Source: PacFIN, Groundfish Report Series
NMFS, Northwest Regional Office

Table 14 - Estimated Recreational Catch (thousands of fish) of Groundfish in Washington, Oregon and California, 1981-1985.

Year	California Southern	California Northern	Oregon	Washington	Coastal Total	Percent of Total Coastal Recreational Catch
1981	4,800	7,600	2,000	3,600	18,000	35.5
1982	6,700	6,200	1,500	3,300	17,500	33.4
1983	3,600	5,400	700	2,500	12,200	27.4
1984	5,300	4,700	700	1,600	12,300	26.3
1985	6,700	4,700	1,000	1,900	14,300	33.1
1986	6,530	4,390	630	1,550	13,100	23.7

Source: National Marine Fisheries Service (NMFS). 1984. Marine Recreational Fishery Statistics Survey (MRFSS), Pacific Coast, 1981-1982, Current Fishery Statistics No. 8323
NMFS. 1985. MRFSS, Pacific Coast, 1983-1984, Current Fishery Statistics No. 8325
NMFS. 1986. MRFSS, Preliminary Unpublished Data for 1985
NMFS. 1987. MRFSS, Preliminary Unpublished Data for 1986

Table 15 - Estimated West Coast Recreational Groundfish Catch (thousands of fish) by mode of fishing, 1981-1986.

Year	Shore	Party/Charter	Private/Rental	Total
1981	3,200	8,700	6,100	18,000
1982	800	9,900	7,000	17,700
1983	1,000	6,500	4,700	12,200
1984	900	4,800	6,600	12,300
1985	900	5,700	7,700	14,300
1986	960	5,350	6,790	13,100

Source: National Marine Fisheries Service (NMFS). 1984. Marine Recreational Fishery Statistics Survey (MRFSS), Pacific Coast, 1981-1982, Current Fishery Statistics No. 8323
NMFS. 1985. MRFSS, Pacific Coast, 1983-1984, Current Fishery Statistics No. 8325
NMFS. 1986. MRFSS, Preliminary Unpublished Data for 1985
NMFS. 1987. MRFSS, Preliminary Unpublished Data for 1986

Table 16 - Average Wholesale Prices ($/pound) of West Coast Groundfish Processed Products by Species Groups, 1977-1986.

Year	All Flounders[1]	Dover	Eng	Petrale	Lingcod	Rockfish	Sablefish
1977	1.226	-	-	-	0.887	0.835	0.697
1978	1.450	-	-	-	0.878	1.095	0.738
1979	N/A	-	-	-	N/A	N/A	N/A
1980	1.600	-	-	-	1.102	0.918	0.831
1981	1.688	-	-	-	1.157	1.011	0.833
1982	1.876	-	-	-	1.162	1.086	0.911
1983	1.923	-	-	-	1.232	1.267	0.893
1984	1.945	-	-	-	1.297	1.255	0.966
1985	1.845	1.743	1.783	3.183	1.455	1.388	1.288
1986	1.7068	1.830	1.875	3.987	1.589	1.452	1.558

1/ Dover, English & Petrale Sole prices were separated out of the All Flounder group beginning in 1985.

Source: Department of Commerce, NOAA, National Marine Fisheries Service, Fishery Resource Statistics Program, Washington, D.C., Unpublished Data from Processed Products Survey.

NOTE: Average prices computed by dividing total value by pounds of processed product, as reported in the NMFS Processed Products Survey.

Table 17 - Number of Reporting Plants that Processed Groundfish on the West Coast, 1980-1986.

Year	California	Oregon	Washington	Total
1980	23	13	25	51
1981	21	16	38	75
1982	19	18	37	74
1983	32	16	34	82
1984	32	11	31	74
1985	30	11	32	73
1986	N/A	12	25	-

N/A - Not Available

Source: Department of Commerce, NOAA, National Marine Fisheries Service, Fishery Resource Statistics Program, Washington, D.C., Unpublished Data from Processed Products Survey

Table 18 - Average Annual Monthly Employment in West Coast Groundfish Processing Plants in 1985-86.

Month	California		Oregon		Washington		Total	
	1985	1986	1985	1986	1985	1986	1985	1986
January	1,970	-	879	918	1,128	1,021	3,977	-
February	1,986	-	880	878	1,236	1,105	4,102	-
March	1,902	-	904	897	1,286	1,279	4,068	-
April	1,903	-	928	1,108	1,337	1,042	4,144	-
May	1,987	-	975	1,163	1,138	1,088	4,053	-
June	1,884	-	1,076	1,220	1,128	1,150	3,987	-
July	2,036	-	1,048	1,257	1,196	1,176	4,308	-
August	1,942	-	1,048	1,238	1,424	1,338	4,414	-
September	2,018	-	1,000	1,249	1,454	1,283	4,472	-
October	1,907	-	907	1,204	1,502	1,304	4,316	-
November	1,872	-	848	1,000	1,225	1,190	3,945	-
December	2,269	-	940	1,168	1,190	1,096	4,399	-

Source: Department of Commerce, NOAA, National Marine Fisheries Service, Fishery Resource Statistics Program, Washington, D.C., Unpublished Data from Processed Products Survey

Table 19 - Selected Imports (metric tons) of Groundfish into West Coast Ports of Entry, by Country of Origin, 1983-1986.

Species	Country	1983	1984	1985	1986
Orange Roughy	New Zealand	1,819	2,547	3,829	4,749
Rockfish	Canada	2,278	2,566	4,252	8,749
Flatfish	Canada	408	505	457	645
Pacific Whiting	Canada	3,328	4,625	7,091	7,597

Source: NMFS, Statistics and Market News
Southwest and Northwest Regional Offices

Table 20 - Average Annual Exchange Rates (Currency/Dollar) with Selected Foreign Countries, 1980-1986.

Year	Canada	Japan	New Zealand
1980	1.1693	226.63	.97340
1981	1.1990	220.63	.86858
1982	1.2344	249.06	.75101
1983	1.2325	237.55	.66790
1984	1.2953	237.45	.57837
1985	1.3658	238.47	.49752
1986	1.3896	168.35	.52456

Source: Federal Reserve Bulletin. 1985. 71(6), p. A68
Federal Reserve Bulletin. 1986. 72(6), p. A68
Federal Reserve Bulletin. 1987. 73(5), p. A68
Washington, D.C.

Table 21. Tokyo wholesale price of sablefish by size of fish, annual average, 1985 and 1986.

Year	5-7 lb.		4-5 lb.		3-4 lb.	
	$/lb.	Y/kg	$/lb.	Y/kg	$/lb.	Y/kg
1985	2.27	1195	2.12	1117	2.00	1054
1986	2.68	1005	2.39	895	2.01	754

Note: Average exchange rate: 1985 - 238 yen/$
1986 - 168 yen/$

Source: Foreign Fishery Information Release, National Marine Fisheries Service, 300 South Ferry Street, Terminal Island, CA 90731.

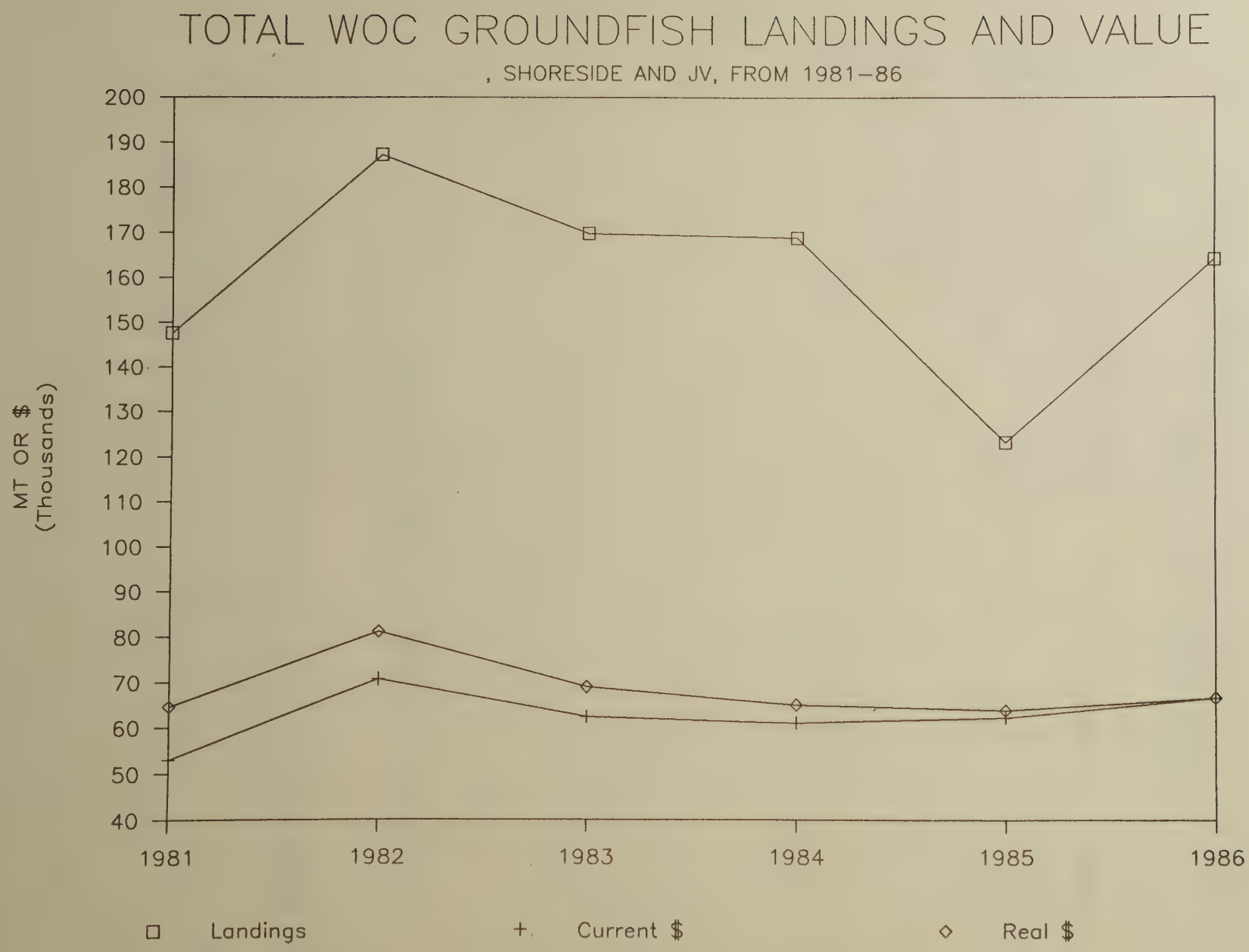


FIGURE 1. Washington, Oregon, and California shoreside and joint venture groundfish landings and exvessel value, 1981-1986.

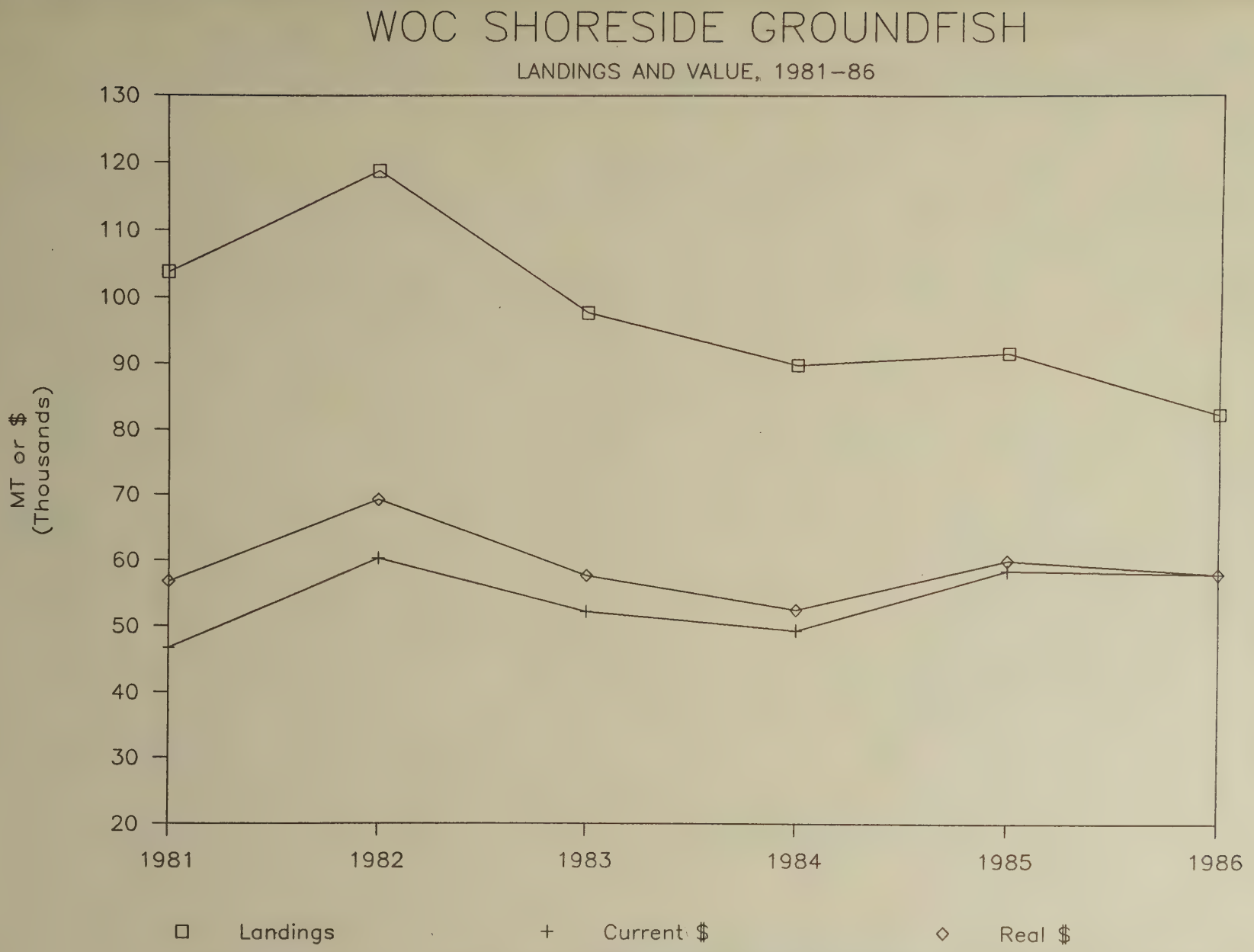


FIGURE 2. Washington, Oregon, and California shoreside groundfish landings and exvessel value, 1981-1986.

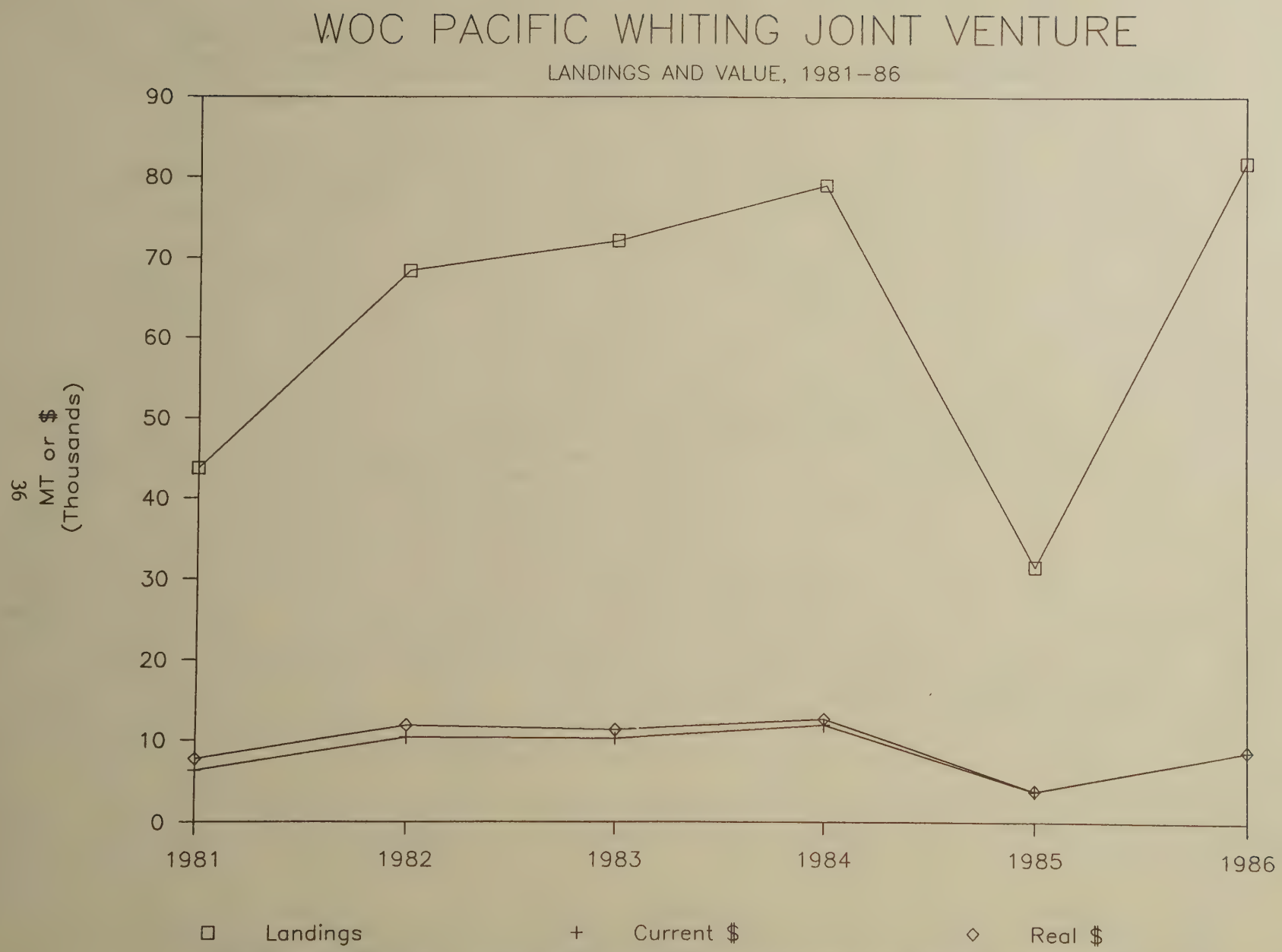


FIGURE 3. Washington, Oregon, and California joint venture landings and exvessel value, 1981-1986.

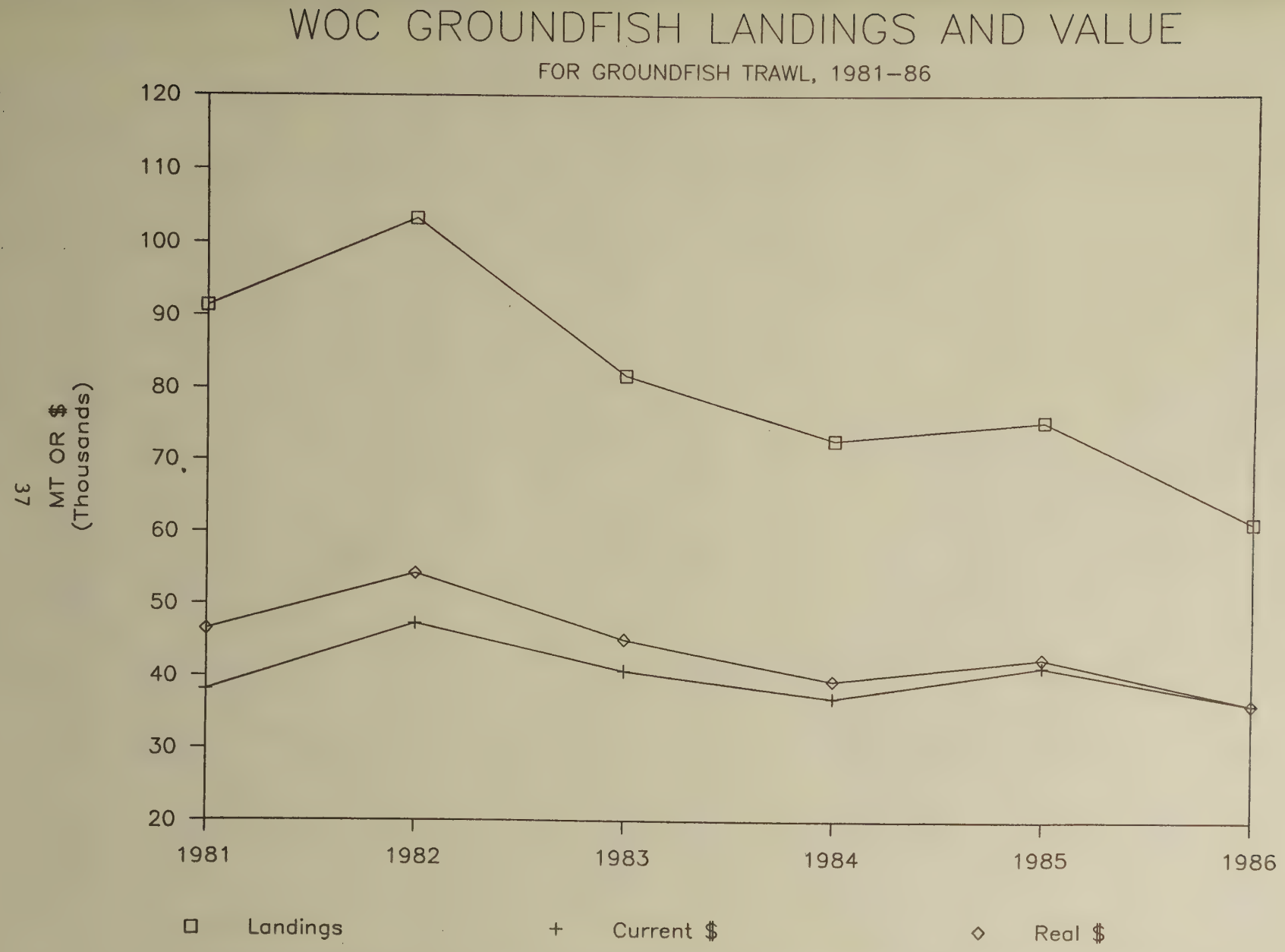
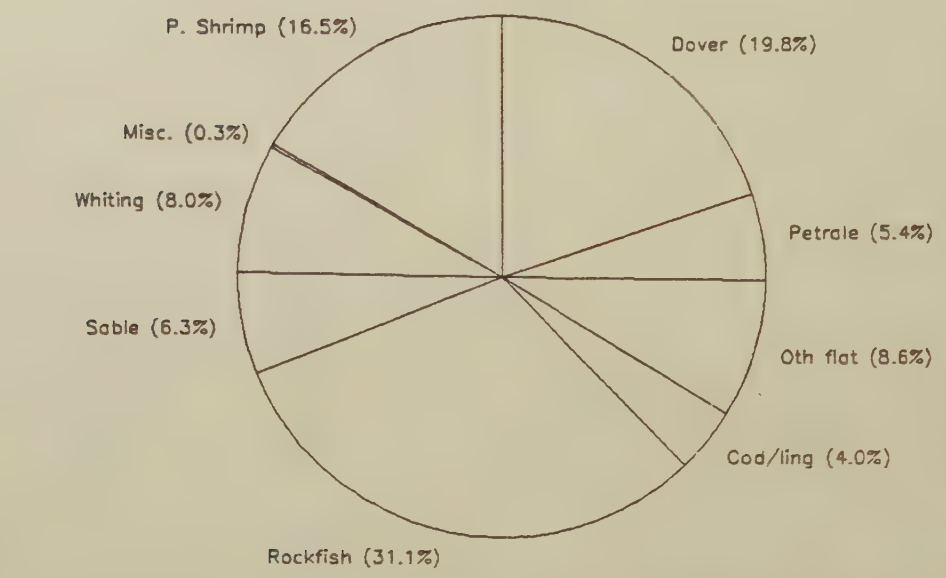


FIGURE 4. Washington, Oregon, and California trawl groundfish landings and exvessel value, 1981-1986.



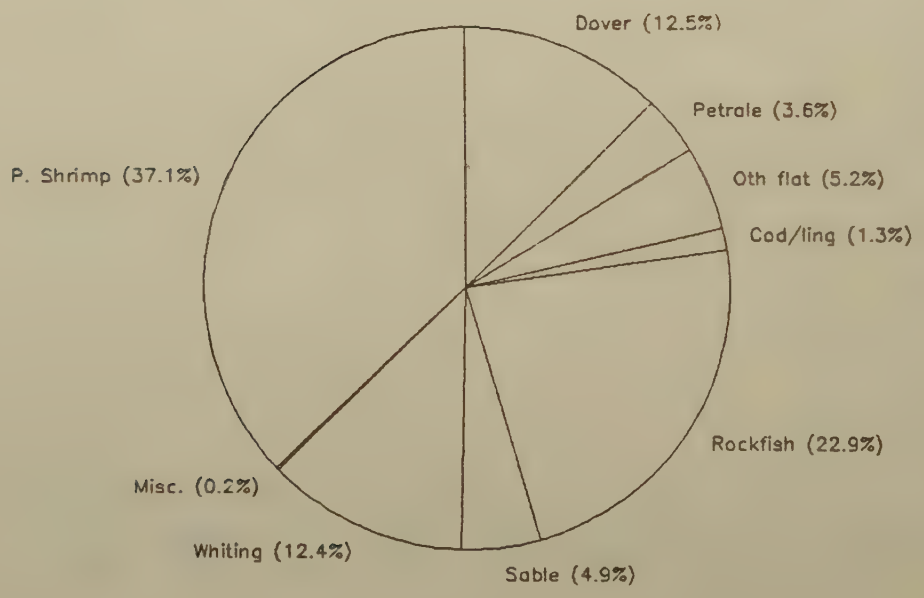


FIGURE 5. Share of gross revenue contributed by each species group to West Coast trawl fleet's combined production of groundfish and pink shrimp, 1985-1986.

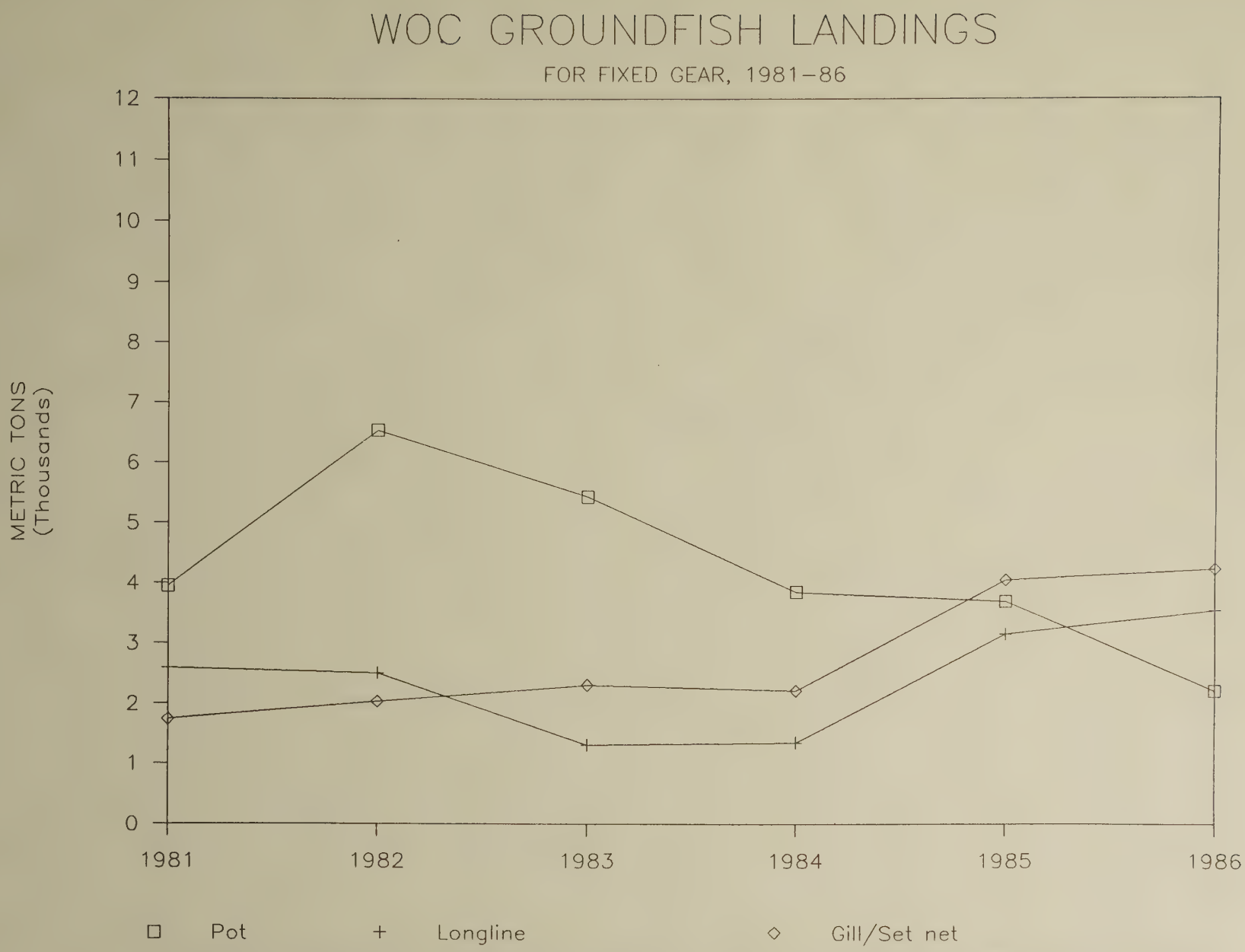


FIGURE 6. Washington, Oregon, and California fixed gear groundfish landings, 1981-1986.